

DESCRIPTION OF THE COURSES

- Course code: ELR3374
- Course title: *ELECTRICAL METROLOGY 2*
- Language of the lecturer: *polish*

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>	<i>1</i>		<i>2</i>		
<i>Number of hours/semester*</i>	<i>10</i>		<i>20</i>		
<i>Form of the course completion</i>	<i>Exam</i>		<i>Acceptance</i>		
<i>ECTS credits</i>	<i>1</i>		<i>2</i>		
<i>Total Student's Workload</i>	<i>40</i>		<i>50</i>		

- Level of the course (basic/advanced): *basic*
- Prerequisites: *Electrical Metrology 1*
- Name, first name and degree of the lecturer/supervisor:
Zdzisław Nawrocki prof.
- Names, first names and degrees of the team's members:
Jerzy BARTOSZEWSKI PhD
Grzegorz KOSOBUDZKI PhD
Daniel DUSZA PhD
- Year: II Semester: 4.....
- Type of the course (obligatory/optional): *obligatory*
- Aims of the course (effects of the course): Students knowledge will be in measurements range:
 - active and reactive power in high voltage power net,
 - resistance and impedance in bridge systems,
 - voltages and currents by compensation methods,
 - digital methods: voltage, phase shift, frequency and period,
 - power loss of ferromagnetic materials.
- Form of the teaching (traditional/e-learning): *traditional*
- Course description:
- Course contains: *Active and reactive power measurement in 1 phase and 3 phase circuit. Direct current resistance bridge, transformer bridge. Analog to digital and digital to analog converters.*
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
<i>1. Active power measurement in 3-phase circuit.</i>	<i>1</i>
<i>2. Reactive power measurement in 3-phase circuit.</i>	<i>1</i>
<i>3. Compensation method in measuring voltage and current.</i>	<i>1</i>
<i>4. Direct current resistance bridge. Thompson bridge, Whetstone bridge.</i>	<i>1</i>
<i>5. Direct current impedance bridge. Wiena bridge, Schering bridge.</i>	<i>1</i>
<i>6. Introduction to digit method of measurement. Sampling, quantization and coding of signal</i>	<i>2</i>
<i>7. D/A and A/D converters and application in digital devices.</i>	<i>2</i>
<i>8. Digital voltmeter.</i>	<i>1</i>

- Classes – the contents:

- Seminars – the contents:
- Laboratory – the contents:
 - a) *Principle of chosen measuring methods for determination parameters of electrical object (zero, compensation method with uses of computer technique)*
 - b) *Determinate parameters of objects and electrical elements (capacitors, inductors, current and voltage instrument transformers, measurement amplifiers, measurement converters).*
- Project – the contents:
- Basic literature:
 1. Chwaleba A., Poniński M., Siedlecki A.: *Metrologia elektryczna*, WNT, W-wa 1994.
 2. *Miernictwo elektryczne – Ćwiczenia laboratoryjne, praca zbiorowa pod redakcją D. Koczeli*, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2001
 3. Kwiatkowski W.: *Miernictwo elektryczne. Analogowa technika pomiarowa*, OW Pol. Warszawskiej, Warszawa, 1998
 4. Tymański S.: *Technika pomiarowa*, WNT, Warszawa, 2007
- Additional literature:
 1. Dacko G., Jaskulski J., Koczela D., *Miernictwo elektryczne*, Skrypt Pol. Wr. 1993.
 2. Marcyniuk A., Pasecki E., Pluciński M., Szadkowski B., *Podstawy Metrologii Elektrycznej* Warszawa, WNT, 1984.
 3. Bartoszewski J., Koczela D.: *Ćwiczenia laboratoryjne z miernictwa elektrycznego*, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 1998.
 4. Orzeszkowski Z.: *Podstawy metrologii elektrycznej*, Wyd. Pol. Wrocławskiej, Wrocław 1981.
- Conditions of the course acceptance/creditation: Exam
- * - depending on a system of studies